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LIN, EDMUND C. C., AND MAGASANIK, BORIS. The Activation of Glycerol Dehydrogenase from *Aerobacter aerogenes* by Monovalent Cations 1820

LIN, EDMUND C. C., LEVIN, ALFRED P., AND MAGASANIK, BORIS. The Effect of Aerobic Metabolism on the Inducible Glycerol Dehydrogenase of *Aerobacter aerogenes* 1824

FISHER, HARVEY F. The Mechanism of the Glutamic Dehydrogenase Reaction. I. The Molecularity of the First Complex Formed 1830

FRIDOVICH, IRWIN, AND HANDLER, PHILIP. Detection of

Free Radicals in Illuminated Dye Solutions by the Initiation of Sulfite Oxidation 1835

TOTTER, JOHN R., DE DUGROS, ELIDA CASTRO, AND RIVEIRO, CARMEN. The Use of Chemiluminescent Compounds as Possible Indicators of Radical Production during Xanthine Oxidase Action 1839

NAKAMOTO, TOKUMASA, KROGMANN, DAVID W., AND MAYNE, BERGER. Oxygen Exchange Catalyzed by Phosphorylating Chloroplasts 1843

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FREEDMAN, AARON D., RUMSEY, PETER, AND GRAFF, SAMUEL. The Metabolism of Pyruvate in the Tricarboxylic Acid Cycle. II. Tissue Characteristic Metabolism of Pyruvate 1854

LANDAU, BERNARD R., ASHMORE, JAMES, HASTINGS, A. BAIRD, AND ZOTTU, SYLVIA. Studies on Carbohydrate Metabolsim in Rat Liver Slices. XV. Pyruvate and Propionate Metabolism and CO_2 Fixation in Rat Liver Slices *in Vitro* 1856

LENGEMANN, F. W. Studies on the Discrimination against Strontium by Bone Grown *in Vitro* 1859

FIELD, JAMES B., PASTAN, IRA, JOHNSON, PHYLLIS, AND HERRING, BETTY. Stimulation *in Vitro* of Pathways of Glucose Oxidation in Thyroid by Thyroid-stimulating Hormone 1863

KOHN, PAUL, AND DMUCHOWSKI, BERNICE L. A Chemical Method for the Degradation of Carbohydrates 1867

VICKERY, HUBERT BRADFORD, AND ZELITCH, ISRAEL. The Metabolism of the Organic Acids of Tobacco Leaves. XVII. Effect of Culture of Excised Leaves in Solutions of Potassium Pyruvate 1871

SMITH, EVELYN E. B., MILLS, GEORGE T., BERNHEIMER, HARRIET P., AND AUSTRIAN, ROBERT. The Synthesis of Type III Pneumococcal Capsular Polysaccharide from Uridine Nucleotides by a Cell-free Extract of *Diplococcus pneumoniae* Type III 1876

PONTREMOLI, S., BONSIGNORE, A., GRAZI, E., AND HORECKER, B. L. A Coupled Reaction Catalyzed by the Enzymes Transketolase and Transaldolase 1881

BONGSIGNORE, A., PONTREMOLI, S., GRAZI, E., AND HORECKER, B. L. Effect of Orthophosphate on the Transaldolase Reaction 1888

EAGLE, HARRY, AGRANOFF, BERNARD W., AND SNELL, ESMOND, E. The Biosynthesis of meso-Inositol by Cultured Mammalian Cells, and the Parabiotic Growth of Inositol-dependent and Inositol-independent Strains 1891

JUNGAS, ROBERT L., AND BALL, ERIC G. Studies on the Metabolism of Adipose Tissue. V. The Effect of a Growth Hormone Preparation and Insulin on the Oxygen Consumption, Glucose Uptake, and Lactic Acid Production 1894

GANGLOFF, EDWIN C., ORTEN, JAMES M., AND SMITH, ARTHUR H. Citric Acid Cycle Patterns in Certain Thyroid States 1900

LYNN, WILLIAM S., MACLEOD, ROBERT M., AND BROWN, ROSE H. Effects of Epinephrine, Insulin, and Corticotrophin on the Metabolism of Rat Adipose Tissue 1904

LYNN, W. S., JR., AND PERRYMAN, N. C. Properties and Purification of Adipose Tissue Lipase 1912

HANAHAN, DONALD J., BROCKERHOFF, HANS, AND BARRON. EDWARD J. The Site of Attack of Phospholipase (Lecithinase) A on Lecithin: a Re-evaluation. Position of Fatty Acids on Lecithins and Triglycerides ... 1917

KOIKE, MASAHIKO, REED, LESTER J., AND CARROLL, WILLIAM R. α-Keto Acid Dehydrogenation Complexes. I. Purification and Properties of Pyruvate and α-Ketoglutarate Dehydrogenation Complexes of *Escherichia coli* 1924

KOIKE, MASAHIKO, AND REED, LESTER J. α-Keto Acid Dehydrogenation Complexes. II. The Role of Protein-bound Lipoic Acid and Flavin Adenine Dinucleotide 1931

KOIKE, MASAHIKO, SHAH, PRAFULCHANDRA C., AND REED, LESTER J. α-Keto Acid Dehydrogenation Complexes. III. Purification and Properties of Dihydrolipoic Dehydrogenase of *Escherichia coli* 1939

KUPIECKI, FLOYD P., AND COON, MINOR J. "Hydroxylamine Kinase" and Pyruvic Kinase 1944

FALENTINE, R. C., AND WOLFE, R. S. Purification and Role of Phosphotransbutyrylase 1948

RAPPORT, MAURICE M., AND ALONZO, NICHOLAS F. The Structure of Plasmalogens. V. Lipids of Marine Invertebrates 1953

FRANCIS, FAITH ELLEN, SHEN, NAI-HSUAN CHANG, AND KINSELLA, RALPH A., JR. Enteric Excretion of Metabolites of Steroid Hormones in the Human. II. Isolation of Δ^5-Androsten-3β-ol-17-one from Meconium 1957

SWELL, LEON, LAW, M. D., FIELD, HENRY, JR., AND TREADWELL, C. R. Cholesterol Ester Fatty Acids

in Serum and Liver of Normal and Lymph-fistula Rats ... 1960

HSIA, S. L., ELLIOTT, WILLIAM H., MATSCHINER, JOHN T., DOISY, E. A., JR., THAYER, SIDNEY A., AND DOISY, EDWARD A. Bile Acids. XIII. Further Contributions to the Constitution of Muricholic Acids ... 1963

KUPFER, DAVID, FORCHIELLI, ENRICO, AND DORFMAN, RALPH I. Metabolism *in Vitro* of 19-Nortestosterone in Female Rat Liver Homogenate ... 1968

BOYACK, JAMES R., AND GIDDINGS, J. CALVIN. Zone and Boundary Diffusion in Electrophoresis ... 1970

BALAZS, ENDRE A., AND SUNDBLAD, LARS. Studies on the Structure of the Vitreous Body. V. Soluble Protein Content ... 1973

MORALES, MANUEL F., AND HOTTA, KEN. The Adenosine Triphosphatase Activity of Myosin B Treated with *S*-β-Aminoethylisothiuronium ... 1979

PIEZ, KARL A., WEISS, ELLINOR, AND LEWIS, MARC S. The Separation and Characterization of the α- and β-Components of Calf Skin Collagen ... 1987

LERNER, AARON B., CASE, JAMES D., AND TAKAHASHI, YOSHIYATA. Isolation of Melatonin and 5-Methoxyindole-3-acetic Acid from Bovine Pineal Glands ... 1992

PETERMANN, MARY L. Ribonucleoprotein from a Rat Tumor, the Jensen Sarcoma. I. The Effect of Magnesium Binding on Ultracentrifugal and Electrophoretic Properties ... 1998

BALLS, A. K., AND BRECHER, A. S. The Precipitation of Denatured Chymotrypsin by Sulfate and Pyrophosphate ... 2004

SCHNABEL, EUGEN, AND LI, CHOH HAO. The Synthesis of Glycyl-L-histidyl-L-phenylalanyl-L-arginyl-L-tryptophyl-glycine and Its Melanocyte-stimulating Activity ... 2010

WELLNER, DANIEL, AND MEISTER, ALTON. Crystalline L-Amino Acid Oxidase of *Crotalus adamanteus* ... 2013

NEUHAUS, FRANCIS C., AND BYRNE, WILLIAM L. Metabolism of Phosphoserine. III. Mechanism of *O*-Phosphoserine Phosphatase ... 2019

GOLDTHWAIT, DAVID A., AND STARR, JASON L. Chromatographic Characterization of Amino Acid Transfer and Microsomal Ribonucleic Acids from Yeast ... 2025

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